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The U.S. Government's Global Hunger & Food Security Initiative



Innovation Lab for Nutrition- Asia **Heifer International Annual Report** **October 1st, 2014- September 30th, 2015**

**Lessons learned from programs
in Nepal that integrate
agriculture and nutrition actions**

**Award
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**Feed the Future Innovation Lab
for Nutrition-Asia**

U.S. Government Partners



Partners in Nepal



Annual Report to Tufts University from Heifer International Activities funded by the Innovation Lab for Nutrition-Asia NEPAL

Year 5 (2014-2015)

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I) Executive Summary

Heifer International received funding from the Nutrition Innovation Lab-Asia to pursue two projects in 2013-2015. These projects are both based in Nepal, and were implemented by their partner organization, Heifer Nepal. The projects are described below, along with the progress in each over the past 12 months.

1. **Project 1B.** This project was a follow-up survey of a cohort of 415 rural families previously studied by Heifer Nepal from 2009-2011 (Project 1A). The families resided in three districts in Nepal: Nawalparasi, Chitwan, and Nuwakot. The initial investigation (Project 1A) was a two-year randomized controlled trial of the effects of community development activities (supervised by Heifer Nepal) on child health and nutrition. Project 1B is a four-year follow-up of these families, assessing primary outcomes of child health and growth, as well as secondary outcomes of household socioeconomic status, income, animal ownership, land ownership, and dietary diversity.
2. **Project 2.** This new project was funded by the Nutrition Innovation Lab, and began in the spring/summer of 2013, in the Banke District in Nepal. The goals are to investigate child health and nutrition in communities randomized to receive one of three interventions: (1) Heifer community development activities and livestock training, supplemented by specific training in child nutrition; (2) livestock training and nutrition training alone; or (3) no activities.

l) **Program Activities and Highlights**

In order to conduct these activities, the existing Memorandum of Understanding (MoU) between Heifer International and the Nutrition Innovation Lab was expanded to cover the scope of activities. Heifer also maintained a consultancy arrangement with Dr. Miller. An MoU between Heifer International and the Harvard School of Public Health was also established.

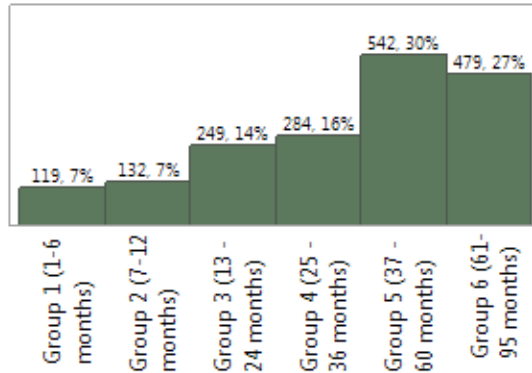
Project 1B. The following activities have been completed:

- a. Completion of field work and data collection.
- b. Data cleaning and data entry.
- c. Data analysis.
- d. Manuscript published in *Food and Nutrition Bulletin*, "Community development and livestock promotion in rural Nepal: Effects on child growth and health," Vol. 35, No. 3, 2014. PDF attached.
- e. Manuscript in press, "Head growth in rural Nepali children," *Paediatrics and International Child Health* (to be featured with accompanying editorial).
- f. Manuscript under review: Dietary diversity among rural Nepali children.
- g. Manuscript preparation in process, "Food allocation choices, household animal resources, and dietary diversity in rural Nepali households"
- h. Manuscript planned, "Household health practices and child growth and health in rural Nepal" (analysis underway).
- i. Manuscript planned, "Women's educational level and responses to a livestock intervention project: outcome of household health practices/SES/income"
- j. Abstracts submitted to the Nutrition Innovation Lab November 2014 Scientific Symposium:
 - a. Growth and Health of Rural Children in 3 Districts of Nepal: Effect of a Community Development Intervention over 48 Months.
 - b. Household and Child Dietary Quality across Seasons in Rural Nepal: Effectiveness of a Community Development Intervention.

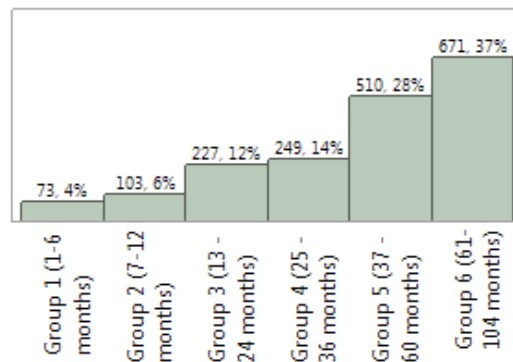
Project 2: The following activities have been completed:

- a. Progress reports and renewals submitted as necessary to NHRC.
- b. Progress reports and renewals submitted to Tufts University Institutional Review Board.
- c. Three rounds of data collection have been completed (Round 1: July-August 2013; Round 2: April 2014; Round 3: November-December 2014). The interval between Round 1 and Round 2 was eight months (there was a delay in starting the project activities due to local conditions); between Round 2 and 3 was seven months, and between Round 1 and 3 was 15 months. The difficulties in this schedule were necessary due to local circumstances. A fourth round was scheduled for April 2015, but was cancelled due to the earthquake in Nepal. A fifth round (24 months from baseline) is scheduled for the end of November 2015. A sixth round is expected in April 2016. This will be a 30-month time point needed for analysis of seasonal trends.
- d. The baseline data collection included 953 households (289 assigned to Heifer plus nutrition training group, 360 assigned to training-only group, and 304 assigned to control group). These households had a total of 1,300 children <5 years of age (350 from Heifer plus nutrition training group, 510 from training only group, and 440 from control group). Altogether, there were 1,057 mothers interviewed (some households had >1 eligible mother as extended family members often share a single household in Nepal).
- e. After the baseline survey, Heifer field teams began work with the Full Intervention group as well as the Training Only group.
- f. The data has been cleaned and entered for the first three rounds. Round 1 and Round 2 have been cross-matched. This remains to be completed in Round 3.

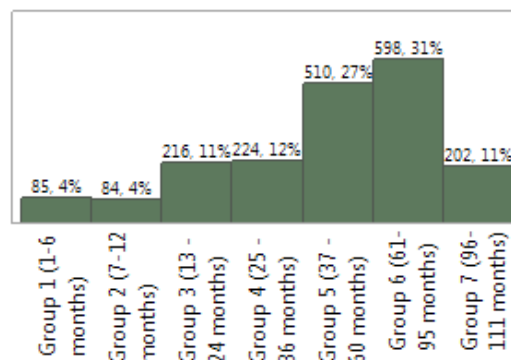
The distribution of ages for the children included in the three surveys is shown below, with the numbers in the target age range (0-60 months) and total indicated:



Round 1: 1,326 in target age range-total 1805. Numbers above each bar indicate N and % of the total for each age group.



Round 2: 1,162 in target age range-total 1,883. Numbers above each bar indicate N and % of the total for each age group.



Round 3: 1,119 in target age range-total 1,919. Numbers above each bar indicate N and % of the total for each age group.

- g. Difficulties have become apparent with matching of the three groups at baseline; further statistical analysis of this problem is underway. An analysis plan will be developed with the aid of our statistical consultants to address this difficulty.

II) Key Accomplishments

Project 1B

- a. Field work and data entry completed.
- b. Additional manuscripts in preparation to be submitted.

Project 2

- a. Project data collection is proceeding
- b. Enrollment expected to provide adequate power for statistical analysis.

III) Research Program Overview and Structure

These research activities have been conducted in collaboration with Heifer Nepal. The organization uses the introduction of livestock and related training as tools for poverty alleviation, citizen empowerment, and community development. Heifer International activities focus on the distribution of livestock and training to rural women's groups with an emphasis on income generation. These activities occur within the context of a strong focus on the development of social capital, specifically citizen empowerment, values training, social mobilization, microcredit, and enterprise. Heifer International values research as a means to inform their field activities and policies. As they are active in 68 countries throughout the world, research findings can be quickly disseminated into field practice, to benefit child health and nutrition outcomes in their project areas. Indeed, results of Project 1A (the initial 24 months of data collection in the Nawalparasi, Nuwakot, and Chitwan Districts) revealed a need for expansion of nutrition education as part of the Heifer Nepal program. Subsequently, a nutrition curriculum was developed for Heifer International programs in Asia and Africa, and is currently being introduced as a supplement to existing Heifer International activities in these regions.

Project 1B:

- 1) Name: "Livestock Interventions in Rural Nepal: Effects on Child Health and Nutrition"
- 2) Description: Follow-on project to allow 48 month longitudinal data collection in cohort initially studied by Heifer International in rural Nepal over 24 months. Project 1A enrolled 611 children in 415 families, with results obtained every six months for two years of a 125-item questionnaire addressing demographics (family composition, socioeconomic status, income sources, livestock ownership, child health, child nutrition, and dietary diversity). In addition, anthropometric data on all household children was collected. While important trends and differences in outcomes were seen at 12 and 24 months, it was hypothesized that improvements in child health and nutrition will increase with longer duration of Heifer interventions. Alternatively, reduced benefits of Heifer activity on child nutrition might have been seen as time progressed. Project 1B was designed to test these hypotheses.

Specific Aim #1: Extend data collection for previous existing project. The opportunity to extend this project provided a special opportunity to obtain longitudinal nutritional data in a large sample of children, in the context of socioeconomic, demographic, and other parameters.

Specific Aim #2: Analyze effects of Heifer Nepal activities on outcomes of child health and nutrition at four years after start of intervention.

- a. Evaluate longer-term outcomes of Heifer activities on child growth and health.
- b. Identify characteristics of families and children who demonstrate most improvement in child nutrition.
- c. Identify characteristics of families and children who demonstrate least improvement in child nutrition.
- d. Use this information to further refine Heifer activities and programs to benefit the most malnourished children.

- 3) Collaborators: Heifer International (Little Rock, Arkansas), Heifer Nepal (Kathmandu, Nepal), Dr. Laurie Miller (Heifer International, Consultant), Dr. Beatrice Rogers (Professor, Friedman School of Nutrition Science and Policy, Tufts University), and Dr. Robert Houser (Statistician, Friedman School of Nutrition Science and Policy, Tufts University). Additional guidance and input from Nutrition Innovation Lab leadership (Dr. Patrick Webb, Dr. Shibani Ghosh, Dr. Jeffrey K. Griffiths).
- 4) **Achievements:**
 - (a) Successfully completed data collection and child anthropometry to obtain 48 month results for 415 households in the Nawalparasi, Nuwakot, and Chitwan Districts.
 - (b) Two manuscripts accepted (one published, the other in press).
 - (c) One manuscript under review.
 - (d) One in near-final form; submission anticipated soon.
 - (e) Three additional manuscripts in preparation.
- 5) **Capacity Building:**
 - (a) Successfully mentored Nepal-based research NGO (Nepal Technical Assistance Group, NTAG) in conduct of longitudinal research project over four years.
 - (b) Supervised Nepali staff in data cleaning and data management for longitudinal research project.
 - (c) Developed research skills of Heifer Nepal office and field staff.
 - (d) Heifer Nepal staff and NTAG staff received training in Ethics of Human Subjects Research.
- 6) **Lessons Learned:**
 - (a) Special expertise is required to successfully conduct longitudinal research projects.
 - (b) Feedback from Field Enumerators can provide valuable insights into project success and candid assessments of interventions.
- 7) **Presentations and Publications:**
 - (a) Published: "Livestock Interventions in Rural Nepal: Effects on Child Health and Nutrition"
 - (b) In press: "Head growth of rural Nepali children"
 - (c) Under review: "Dietary diversity among rural Nepali children"
 - (d) Discussion and revisions with coauthors underway, with anticipated submission by October 1, 2015. "Duration of program exposure is associated with improved outcomes in nutrition and health: the case for longer project cycles from intervention experience in rural Nepal.
 - (e) Manuscript preparation in process, "Food allocation choices, household animal resources, and dietary diversity in rural Nepali households"
 - (f) Manuscript planned, "Household health practices and child growth and health in rural Nepal" (analysis underway).
 - (g) Manuscript planned, "Women's educational level and responses to a livestock intervention project: outcome of household health practices/SES/income"
 - (h) Abstracts presented at Nutrition Innovation Lab November 2014 Scientific Symposium:
 - (i) Growth and Health of Rural Children in 3 Districts of Nepal: Effect of a Community Development Intervention over 48 Months
 - (ii) Household and Child Dietary Quality across Seasons in Rural Nepal: Effectiveness of a Community Development Intervention

Project 2

- 1) Name: "Child health and nutrition after livestock interventions in rural Nepal: disaggregating the effects of social capital development and training inputs"
- 2) Description: Project 2 was designed to extend on the results from Project 1A. While important effects on child nutrition and health were observed in the first two years of data collection for Project 1, it was recognized that these changes occurred in the absence of specific interventions addressing nutrition. Thus, we hypothesized that inclusion of a nutrition intervention would further improve child nutritional outcomes. A basic nutrition education curriculum was developed and field tested by Heifer Nepal. However, the effect of the use of this curriculum on child growth is unknown. In addition, Heifer Nepal activities in Project 1A were not disaggregated with regard to specific animal husbandry training, provision

of livestock, and community/social capital development. Heifer Nepal community development activities typically include broad supports related to promotion of social capital (values training, facilitation of formation of women's groups, social mobilization, training in savings, microcredit, and enterprise), along with training in animal husbandry and provision of livestock. Given the results in Project 1A and 1B, it was important to attempt to isolate the effect of the community development activities on the child health and growth outcomes.

Specific Aim #1: Conduct a randomized controlled trial to evaluate the effects of the nutrition curriculum on child growth. The trial was designed to include matched communities in Heifer Nepal working areas. Communities were randomly assigned to receive either: (1) Heifer activities plus the nutrition curriculum; (2) training in child nutrition and animal husbandry, and provision of livestock, without social capital activities; or (3) no interventions. Surveys to address demographics (family composition, socioeconomic status, income sources, livestock ownership, child health, child nutrition, and dietary diversity) were conducted at baseline, and then every six months for two years (five surveys total; two are completed). Anthropometric measurements are obtained on all household children at each survey time, along with indicators of child health.

Specific Aim #2: Analyze the effects of the introduction of the nutrition curriculum on child growth and nutritional status.

- a. Assess child nutritional outcomes.
- b. Determine characteristics of families related to child nutritional and health status.
- c. Identify behavioral changes among participants as a result of curriculum.
- d. Conduct focus groups among participants to evaluate responses to the use of the curriculum.

- 3) **Collaborators:** Heifer International (Little Rock, Arkansas), Heifer Nepal (Kathmandu, Nepal), Dr. Laurie Miller (Heifer International, Consultant), Dr. Beatrice Rogers (Professor, Friedman School of Nutrition Science and Policy, Tufts University), and Dr. Robert Houser (Statistician, Friedman School of Nutrition Science and Policy, Tufts University). Additional guidance and input from Nutrition Innovation Lab leadership (Dr. Patrick Webb, Dr. Shibani Ghosh, Dr. Jeffrey K. Griffiths).
- 4) **Achievements:** With the assistance of Valley Research Group, field enumerators enrolled 953 households (289 assigned to Heifer plus nutrition training group, 360 assigned to training-only group, and 304 assigned to control group). Baseline data was collected from 1,057 mothers in these households (some conjoint households had >1 eligible mother), and anthropometry and child health information was obtained on 1300 children <5 years of age (350 from Heifer plus nutrition training group, 510 from training only group, and 440 from control group). All but 72 mothers were re-interviewed in Round 2 of data collection; an additional 17 mothers and their children were enrolled. For Round 3, 1,025 mothers were interviewed.
- 5) **Capacity Building:** (a) Heifer Nepal office and field staff, as well as the Valley Research Group team, received training in Ethics of Human Subjects Research prior to each round of field work; (b) Heifer Nepal and Valley Research Group teams received mentoring in conduct of longitudinal research.; (c) Heifer Nepal and Valley Research Group teams received mentoring in statistical methods; and (d) Nepali dietitians were mentored in development of nutrition training curriculum.
- 6) **Lessons Learned:** We have encountered two problems which interfered or likely will interfere with data collection in our project area. The baseline data collection took place during July-August 2013. Round 2 data collection, which was initially scheduled for January-February 2014, was postponed until March-April 2014, due to unexpected political activity in the area which made travel difficult. Round 3 of data collection took place in November 2014, but at the end of August 2015, the region was devastated by severe mud slides. There has been extensive loss of life, property, and livestock. At the moment, the situation is chaotic, and humanitarian aid is being provided. Round 4 was cancelled due to the major earthquake in April 2015. The next round of data collection is scheduled for November 2015. However, difficult political conditions currently prevail in Nepal, with instability in some areas of the country.
- 7) **Presentations and Publications:** None to date.